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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

September 17, 1941

NATION-WIDE SURVEY SHOWS OVER THIRD OF
U. S. CORN ACREAGE PLANTED TO HYBRIDS

Hybrid corn is on the march, and this year its outposts are firmly entrenched in the far corners of the Nation. Starting its advance from the Corn Belt a few years ago, it has captured an immense acreage and is continuing to consolidate its gains. This year in order to determine the spread of hybrid corn acreage outside the Corn Belt the United States Department of Agriculture's Marketing Service made a reconnaissance survey of all States. The survey revealed material advances in the Pacific Northwest and in the Northeastern States. Washington planted 24 percent of its total corn acreage with hybrid seed, New York 16 percent. The smallest advance was in the South where adapted hybrids have not been developed on a large scale. Texas had only 2 percent of its total corn acreage planted with hybrid seed.

In 1938, 12 million acres or about 23 percent of the total corn acreage in the Corn Belt was planted with hybrid seed. A year later, 1939, about 21 million acres or 39 percent of the Belt's total acreage was in hybrids. This year about 31 million acres or 62 percent of the corn acreage in that area is in hybrids. The estimates are based on annual field surveys of the Agricultural Marketing Service beginning in 1938 and on surveys made by the Agricultural Adjustment Administration covering the 1939 and 1940 crops in the commercial corn counties.

Added significance is given the spectacular increase in hybrid corn in the Corn Belt when it is realized that the total corn acreage has dropped from 62 million to 50 million acres since 1936, while hybrid acreage has increased from a mere beginning in 1936 to 31 million acres or 62 percent of the Corn Belt's total in 1941. At the same time yields have been increasing so that production has not dropped proportionally. It is a case of doing more with less.

LARGER YIELDS OBTAINED FROM HYBRIDS

While the increase in hybrid corn acreage was of near geometric proportions at first, the reason for the enormous expansion can be explained by simple arithmetic. Experiment station data and surveys made by the Agricultural Marketing Service and the Agricultural Adjustment Administration indicate that depending on the adaptation and the conditions under which they are grown, hybrids outyield the open-pollinated varieties by 10 to 30 percent or more. A bushel of corn will plant 7 acres in the Corn Belt. If hybrids outyield open-pollinated varieties by only 15 percent under similar conditions, they will be yielding 28.75 bushels per acre when open-pollinated corn is yielding 25 bushels. That means an increase on the 7 acres of 26.25 bushels in favor of hybrids. In other words, 7 acres of hybrids would produce a little more than 8 acres of open-pollinated corn.

The hybrid advantage appears to prevail on a relative basis. That is to say, adapted hybrids will outyield open-pollinated varieties by approximately the same percentage on soils of low and high fertility. Then if open-pollinated on fertile soil yields at a 50 bushel level, hybrids with their 15 percent advantage will yield 57.5 bushels per acre and on the 7 acres this would mean 52.5 bushels more. The only increased cost in the growing of hybrids is the higher cost of seed and the added expense of harvesting a larger production. So far there has been no objection to the increased cost of harvesting a larger crop. The relative advantage

explains in part why hybrids have made such tremendous increases in the Corn Belt and slower gains on less fertile land elsewhere.

The rapid progress in the development of hybrids represents the untiring efforts of breeders and the early sacrifices of many seedsmen. The formula for hybrid corn was known before the turn of the present century but it was not put to practical use until a few years ago. Hybrid seed is the product of crossing two or more strains of corn which have been inbred for several generations to bring out the good and bad characteristics -- the strains with good characteristics are kept, the bad rejected. In this way a hybrid, like the Army's new streamlined division, has been stripped of its encumbrances, the undesirable characteristics. When this has been accomplished, the individual plants from a hybrid are as much alike as peas in a pot, as uniform as an army in uniform. And like the individual soldier in a well-trained army, every plant does its part. There are few barren plants in fields planted with hybrid seed.

Corn is a pampered crop which would soon become extinct without the care of man. From aboriginal days its seed has been stored carefully for the next year's planting. But it's a lot tougher now than it used to be - just like the army mule, which is also a hybrid. Just as the army is hardening its men, so is corn being hardened and it grows tougher by the year as breeders overcome more obstacles. A good hybrid is provided with an extensive and sturdy root system which enables it to resist blitz winds, to better withstand the devastating effects of heat and drought. Corn is also being hardened to resist the subversive activities of fifth-columnist chinch bugs and the European corn borer, but much work is yet to be done in developing hybrids with a tight husk to resist corn ear worm and the weevil, corn's chief insect enemy in the South.

The 1941 Nation-wide survey indicated that 37 percent or approximately 33 million of the Nation's 87 million acres of corn were planted with hybrid seed. This year 95 percent of the Iowa corn acreage is in hybrids. In 1936 hybrids were being grown on only about 5 percent of the total corn acreage in that State. The acreage of hybrid corn in Illinois this year amounts to 87 percent of the total as compared with 76 percent in 1940. The proportion of hybrids in Indiana has increased from 63 percent in 1940 to 80 percent in 1941. In Ohio the percentage of the corn acreage devoted to hybrids in 1941 was 74 percent, only 56 percent in 1940. In all of Iowa, except the western and southern counties, throughout the northern half of Illinois, parts of south central Minnesota and scattered sections through southern Wisconsin, northern Indiana and Ohio, hybrids this year are being grown on 95 percent or more of the total corn acreage. A survey made of the 1939 corn acreage in the commercial corn counties of this area by the North Central Division, Agricultural Adjustment Administration, revealed that a few counties had as much as 95 percent of the total acreage in hybrids, but most had less than 90 percent. A similar survey made by that agency covering the 1940 crop showed many counties with 98 to 99 percent in hybrids and most with well over 90 percent. Indications are that this year hybrid corn acreage has virtually reached full expansion - 100 percent - in a large number of counties. Missouri and Michigan made material increases in hybrids this year but in the Dakotas, Nebraska and Kansas, the increases have been relatively small. Droughts in these Plains States have severely retarded the development of adapted hybrids for that area.

In the East and Northeast, the percentage of the corn acreage planted with hybrid seed continues to increase. New York increased from 12 percent last year to 16 percent this year; New Jersey from 20 to 31 percent; Pennsylvania from 12 to 20 percent; Maryland from 10 to 25 percent.

Spread of Hybrid Acreage Limited in South

In all of the Southern States, the spread of hybrid corn acreage has been limited by the lack of adapted seed and by the fact that the hybrid advantage on a bushel basis is less on the lower yielding soils. Even where adapted hybrids are available, growers are trying them out on a small scale by planting only one field or even only a part of a field with hybrid seed. In Tennessee, for example, where 3 percent of the total corn acreage is in hybrid this year, the increase in the percentage of growers reporting hybrid was three times as large as the percentage increase in acreage.

In the Western States hybrids are concentrated largely on irrigated land in Colorado, New Mexico, Utah, Idaho, Oregon, and Washington. While the hybrid acreage in Colorado amounts to only 5 percent of the State's total acreage of corn, some of the irrigated areas have between 10 and 15 percent in hybrids. In Utah the proportion of hybrid is as much as 30 percent in some areas and some sections of Idaho have over 20 percent of the total corn acreage planted with hybrid seed. In Washington 24 percent of the 1941 corn acreage is in hybrids as compared with 11 percent in 1940. Oregon had 21 percent of its corn acreage in hybrids in 1941. Last year 11 percent of the acreage was planted with hybrid seed.

It has been said that an army marches on its stomach. Heavy yielding corn also has a hearty appetite - it must have sufficient plant food materials. There are being provided in the form of fertilizer, the use of which is being increased each year and by the more widespread practice of soil conservation. High speed machinery is making it possible to plant in good season, to keep down weed growth and to harvest the crop with a minimum of loss. The seed is being handled and stored in such a way that it is likely to give a better stand. With the decreasing acreage of corn in the Corn Belt, the corn is being grown on more fertile fields and the hybrids, by reason of their relative advantage in yield, on the most fertile fields. All of these factors tend to increase yields of open-pollinated as well as hybrid corn - to make the evaluation of the effect of hybrids on yield per acre more difficult, particularly since hybrids vary widely in yielding power. There is no doubt that adapted hybrids outyield the best open-pollinated varieties. Conversely a good or perhaps even mediocre open-pollinated variety is often superior to an unadapted hybrid.

Even so the net effect of the remarkable shift to hybrids has been the addition of many millions of bushels to the Nation's corn crop. Certain it is that the Nation's corn growers, in producing more on a smaller area and conserving at the same time man and machine power, are in full stride with the National Defense program.

Only slightly more than a third of the Nation's corn acreage was planted with hybrid seed this year. With corn hybrids continuing to be improved everywhere and the acreage of hybrid even further increased in the Corn Belt as well as outside that area, the ultimate effect of hybrids as a factor in corn production cannot be fully evaluated at the present time.

CORN ACREAGE PLANTED WITH HYBRID SEED, 1940-1941

State	1940 (Revised)			1941 (Preliminary)		
	Percentage		Indicated	Percentage		Indicated
	All Corn	planted with		All Corn	planted with	
	Acreage	Hybrid seed	Acreage	Acreage	Hybrid seed	Acreage
	Thous. Acres	Percent	Thous. Acres	Percent	Thous. Acres	
Maine 1/	13	--	--	12	1	--
N. H. 1/	15	--	--	15	10	2
Vt. 1/	71	--	--	72	18	13
Mass. 1/	38	--	--	38	12	5
R. I. 1/	9	--	--	9	20	2
Conn. 1/	49	--	--	49	40	20
N. Y.	692	12	83	671	16	107
N. J.	189	20	38	183	31	57
Pa.	1,341	12	161	1,301	20	260
Ohio	3,220	56	1,803	3,252	74	2,406
Ind.	3,937	63	2,480	3,937	80	3,150
Ill.	7,551	76	5,739	7,627	87	6,635
Mich.	1,558	23	358	1,511	42	635
Wis.	2,255	53	1,195	2,232	64	1,428
Minn.	4,366	59	2,576	4,497	64	2,878
Iowa	9,031	90	8,128	9,121	95	8,665
Mo.	3,976	26	1,034	3,936	45	1,771
N. Dak.	1,031	4	41	1,155	6	69
S. Dak.	3,080	12	370	3,018	19	573
Nebr.	6,831	25	1,708	6,968	32	2,230
Kans.	3,051	8	244	2,624	13	341
Corn Belt	49,887	51.5	25,676	49,878	61.7	30,781
Del.	141	4	6	137	15	21
Md.	501	10	50	461	25	115
Va.	1,377	3	41	1,322	5	66
W. Va.	476	8	38	443	12	53
N. C. 1/	2,418	--	--	2,370	2	47
S. C. 1/	1,736	--	--	1,701	1	17
Ga. 1/	4,259	--	--	4,089	1	41
Fla. 1/	821	--	--	837	1	8
Ky.	2,816	7	197	2,816	12	338
Tenn.	2,767	2	55	2,712	3	81
Ala. 1/	3,476	--	--	3,372	1	34
Miss. 1/	3,024	1	30	2,873	1	29
Ark. 1/	2,043	--	--	2,043	6	123
La. 1/	1,540	--	--	1,478	4	59
Okla. 1/	1,952	--	--	1,893	2	38
Tex. 1/	4,632	--	--	4,725	2	94
Mont. 1/	164	--	--	180	2	4
Idaho 1/	34	--	--	39	16	6
Wyo. 1/	216	--	--	197	2	4
Colo.	1,043	1	10	1,022	5	51
N. Mex. 1/	199	--	--	209	6	13
Ariz. 1/	25	--	--	29	2/	--
Utah 1/	22	--	--	22	8	2
Nev. 1/	4	--	--	5	2/	--
Wash. 1/	29	11	3	30	24	7
Oreg. 1/	60	11	7	60	21	13
Calif. 1/	64	--	--	70	2/	--
U. S.	88,143	29.9	26,395	87,363	37.2	32,511

1/ First survey made in 1941.

2/ Less than 1 percent.

hsj

PERCENTAGE OF TOTAL CORN ACREAGE PLANTED WITH HYBRID SEED, 1941



